Eastern Connecticut Corridor Rail and Transit Feasibility Study (ECRTS)

Preliminary Feasibility Assessment
Appendix B: Transit Oriented Development (TOD) Corridor Scan

March 2023

Prepared by AECOM Technical Services, Inc.

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1. Overview and Definitions

This document provides an initial analysis of existing economic conditions in the study area surrounding the two study corridors: the Thames River Corridor and a possible Shore Line East (SLE) extension on the Northeast Corridor.

The Thames River Corridor includes two possible rail alignments (tracks are located along the East and West sides of the river). For this analysis, the East alignment includes the Groton Secondary, an existing rail spur extending south from the Northeast Corridor along a curve between the Groton - New London Airport and major employers General Dynamics Electric Boat and Pfizer.

The goals of this Transit Oriented Development (TOD) Corridor Scan are to:

- Identify economic centers, activity nodes, and populations that could benefit from improved transit access
- Evaluate initial opportunities and considerations for TOD
- Highlight potential economic impacts of different alignment choices (e.g., East vs. West alignment along the Thames River)

Future phases of this study will include a more detailed market analysis and evaluation of the economic opportunities that improved transit may create.

Study Area Geographies

Two study area geographies are referenced throughout this document:

1. The **"SLE & Norwich Extension Study Area"** (i.e. "Study Area Communities"), which includes the entirety of the10 communities that touch either of the study area rail corridors
2. The **"TOD Focus Area"** (i.e. "Focus Area"), a 2-mile radius buffer created along the study area rail corridors

Where appropriate, the Study Area Communities and the Focus Area are bifurcated along the Thames River to demonstrate differences between the East and West side of the river.

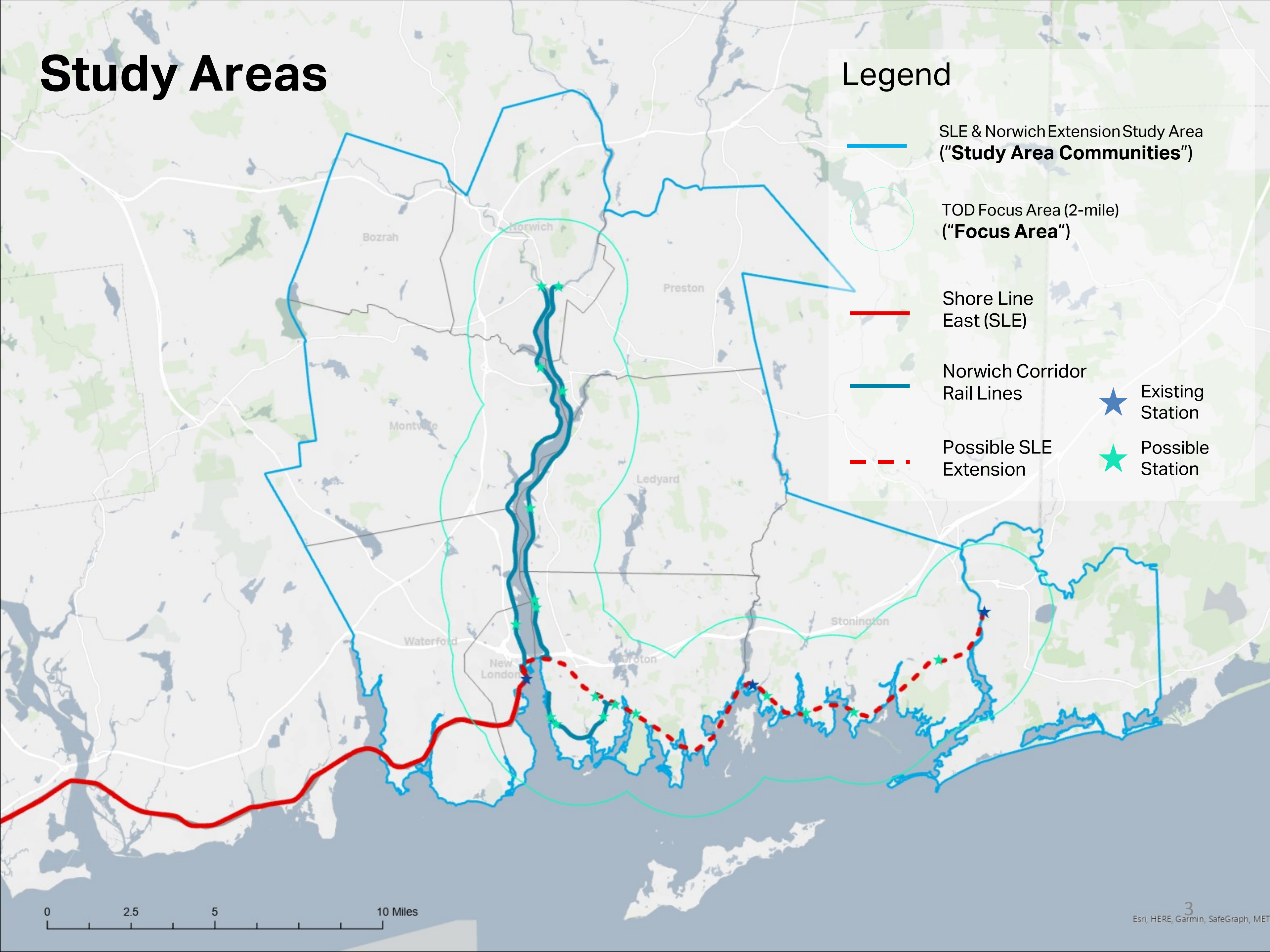
The two corridors also include two types of stations :

1. **Existing Stations**: Stations that currently existing within the Study Area Towns, which may need infrastructure upgrades and capital investment in order to serve the proposed SLE extension. New London Station is currently served by SLE commuter rail service. New London, Mystic, and Westerly Stations are currently served by Amtrak intercity passenger rail service.

2. **Possible Stations**: Potential station locations highlighted by CTDOT and stakeholders as priority focus areas for stations.

The study area corridors and stations are shown on the map on the following page.

Study Areas



Legend
SLE & Norwich Extension Study Area
("Study Area Communities")
TOD Focus Area (2-mile)
("Focus Area")
Shore Line East (SLE)
Norwich Corridor Rail Lines
Possible SLE Extension
Existing Station
Possible Station
Norwich
Bozrah
Preston
Montville
Ledyard
Waterford
New London
Groton
Stonington
0
2.5
5
10 Miles
Esri, HERE, Garmin, SafeGraph, MET

Introduction to TOD

The State of Connecticut defines TOD as:

"…the development of residential, commercial and employment centers within **one-half mile or walking distance of public transportation facilities**, including rail and bus rapid transit and services, that **meet transit supportive standards for land uses, built environment densities and walkable environments**, in order to facilitate and encourage the use of those services." (**Section 13b-79o** of the Connecticut General Statutes).

Note that this preliminary analysis uses a broader 2-mile TOD focus area, since the station area locations are not yet confirmed, and previous research has found that park-and-ride commuters are an important driver of transit demand and economic activity around rail station areas in other parts of Connecticut.

Factors Influencing TOD Potential

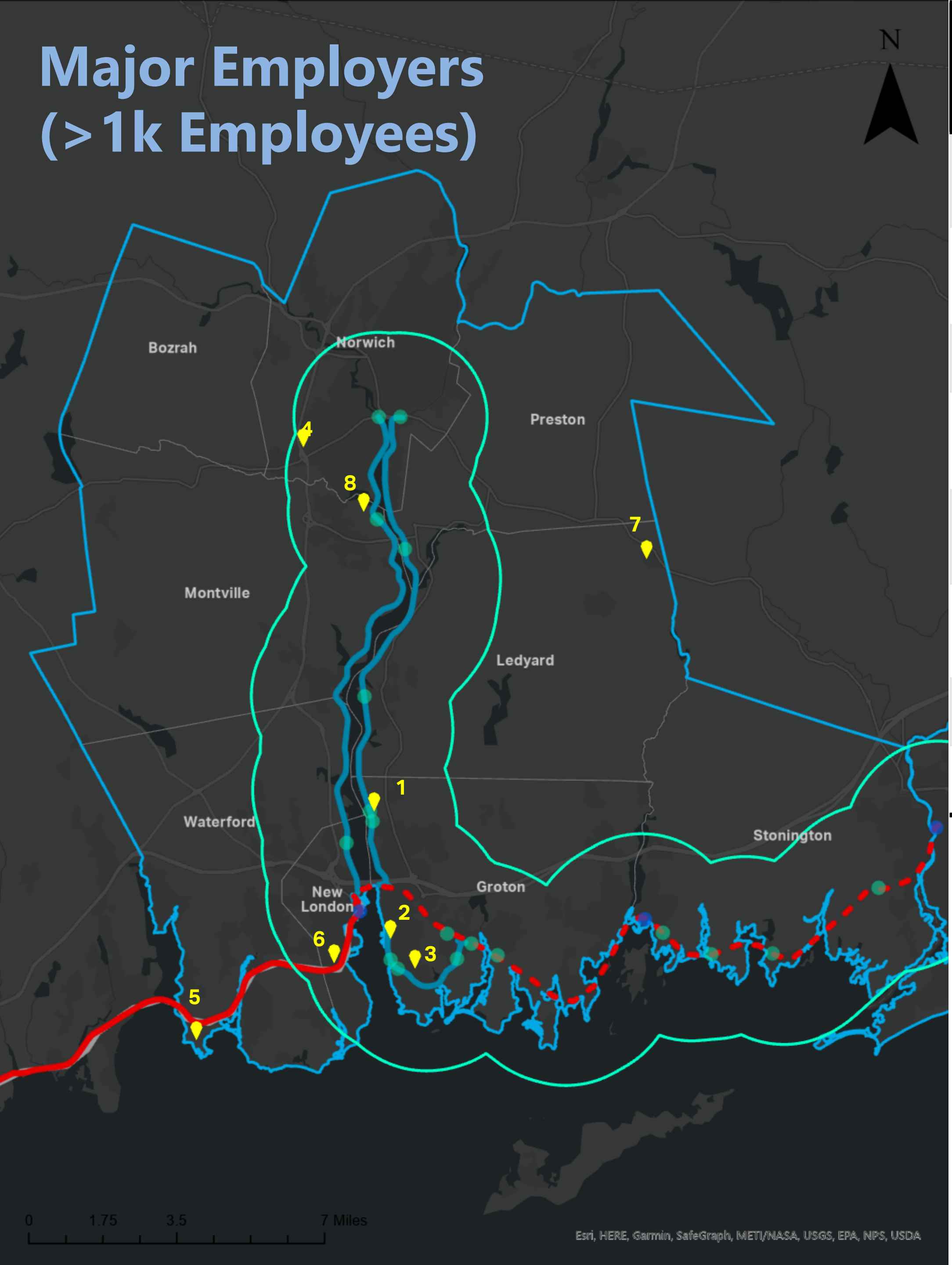
Previous research has found that TOD is most likely to occur in transit station areas with characteristics including:

- Direct transit **connections to major employment centers** such as regional downtowns
- Strong underlying **real estate market strength**, as indicated by recent investment in multi-family housing and employment space, rising rents, declining vacancies, etc.
- **Transit-supportive demographics** (e.g., Baby Boomer households looking to downsize, younger renters who prioritize amenity-rich neighborhoods, immigrants)
- Concentrations of **professional and financial services** and other "knowledge-based" employment – these firms are more likely to locate near transit
- Local **land use policies and infrastructure investment** that are supportive of higher-intensity development

Source: "Economic Context Report: San Diego Regional TOD Strategy," prepared for SANDAG and AECOM by Strategic Economics, 2014.

2. EXISTING ACTIVITY NODES

Major Employers (>1k Employees)



ID	Employer	Industry	Location	Employees	Distance to Closest Station (ft)
1	U.S. Navy Submarine Base	Military	Groton	>10,000	10ft
2	Electric Boat Corp.	Water Transportation R&D	Groton	>8,000	37ft
3	Pfizer	Pharmac-eutical	Groton	>5,000	42ft
4	William W. Backus Hospital	Medical Facility	Norwich	>1,800	1,848ft
5	Millstone Power Station	Nuclear Power	Waterford	>4,000	4224ft
6	Lawrence Memorial Hospital	Medical Facility	New London	>12,000	1,056ft
7	Foxwood Casino	Hospitality	Ledyard	>2,000	528ft
8	Mohegan Sun	Hospitality	Montville	>8,000	37ft

Source: Town and City Comprehensive Annual Financial Reports (CAFRs) for 2021**

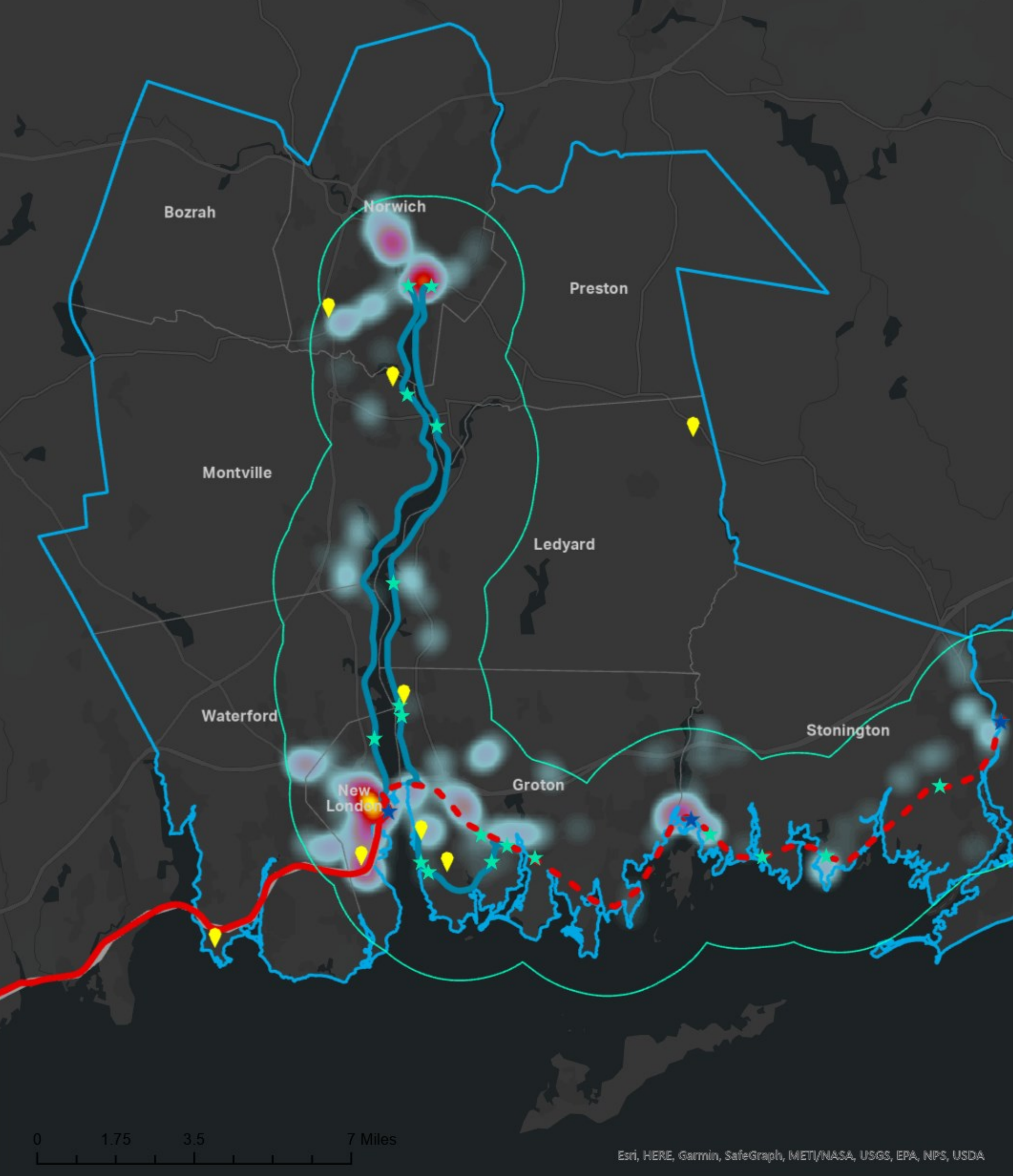
Legend

- Existing Station*
- Possible Station*
- Employer Location

* Circles reflect ¼ mile radius around stations

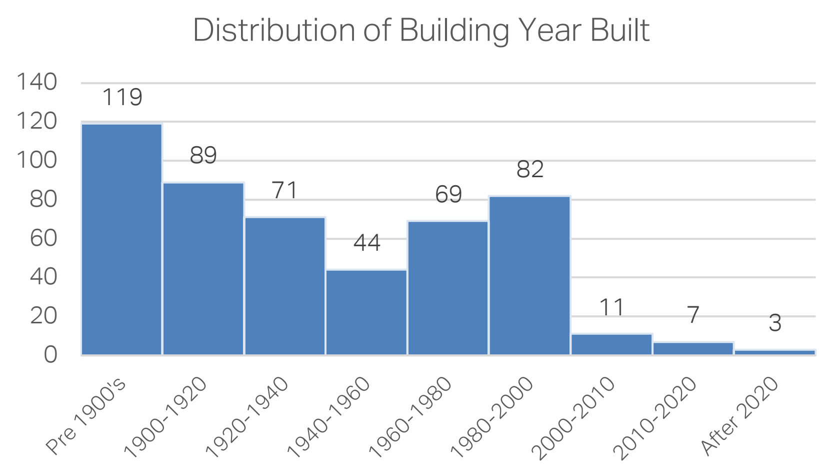
** The study team was not able to independently verify employment numbers

Office Building Concentrations in TOD Focus Area



Key Takeaways:

- Offices are concentrated near existing New London and Mystic Stations, as well as near the possible Norwich Stations
- Most office development pre-dates 2000; very little investment in new office buildings has occurred in the last 20 years



Source: CoStar, AECOM Analysis

Legend

Existing Station

Possible Station

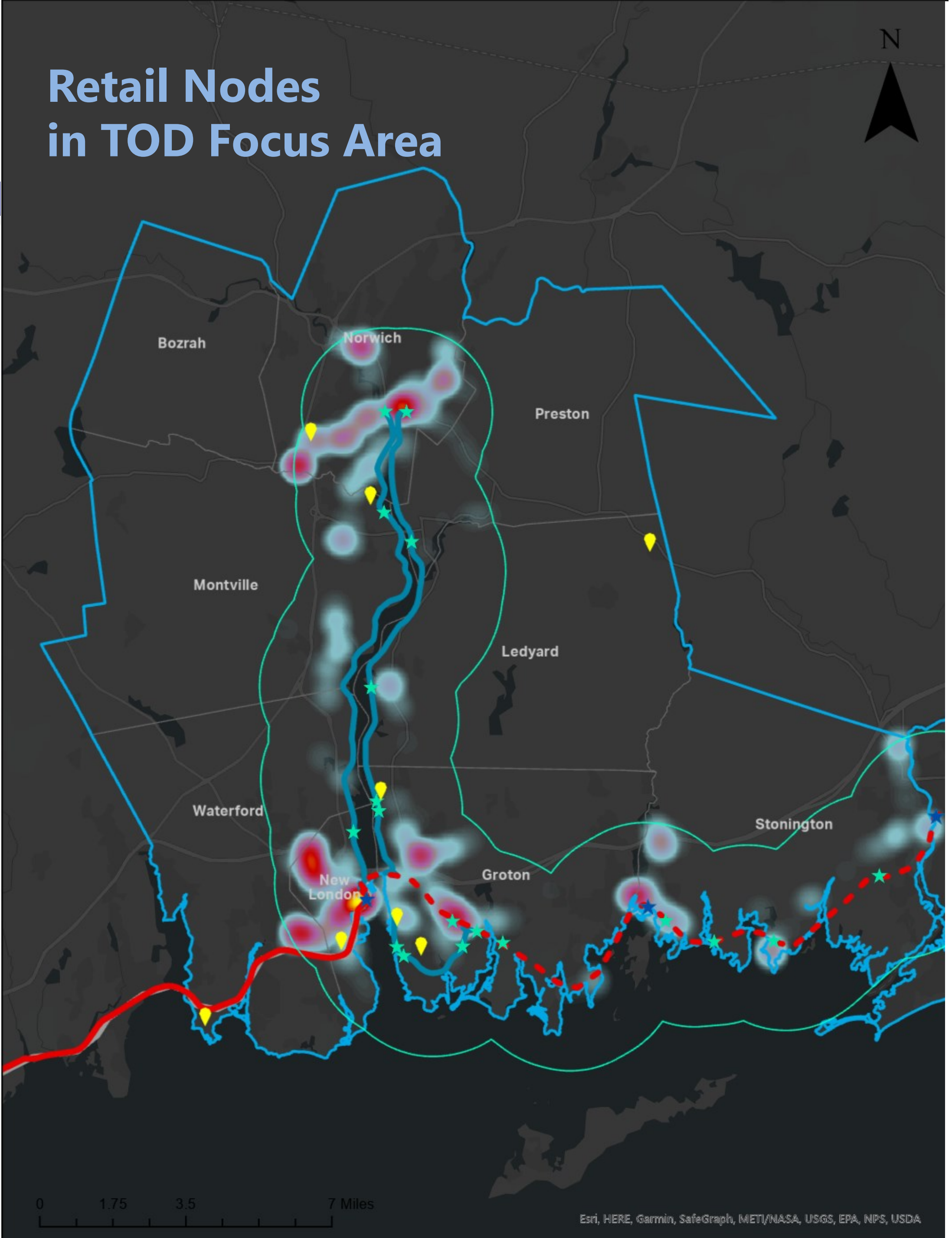
Major Employer

Sparse

Dense

*Office Density weighted by rentable building area (rba)

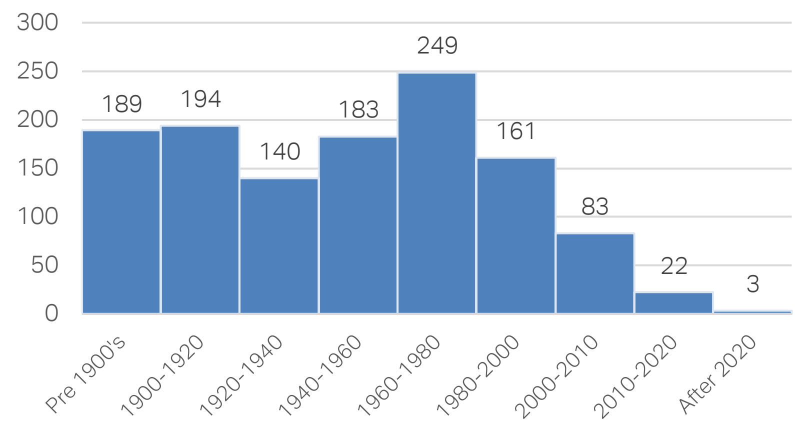
Retail Nodes in TOD Focus Area



Key Takeaways:

- Retail nodes are more dispersed along commercial corridors and shopping centers, but still concentrated around the urban centers
- There are 2.5 times more retail buildings than office buildings; trip data reveals that shopping is the predominant purpose of travel for trips originating in the area
- While there has been some new investment in retail (particularly in the 2000s), most of the retail stock is older

Distribution of Building Year Built



Source: CoStar, AECOM Analysis

Legend

Existing Station

Possible Station

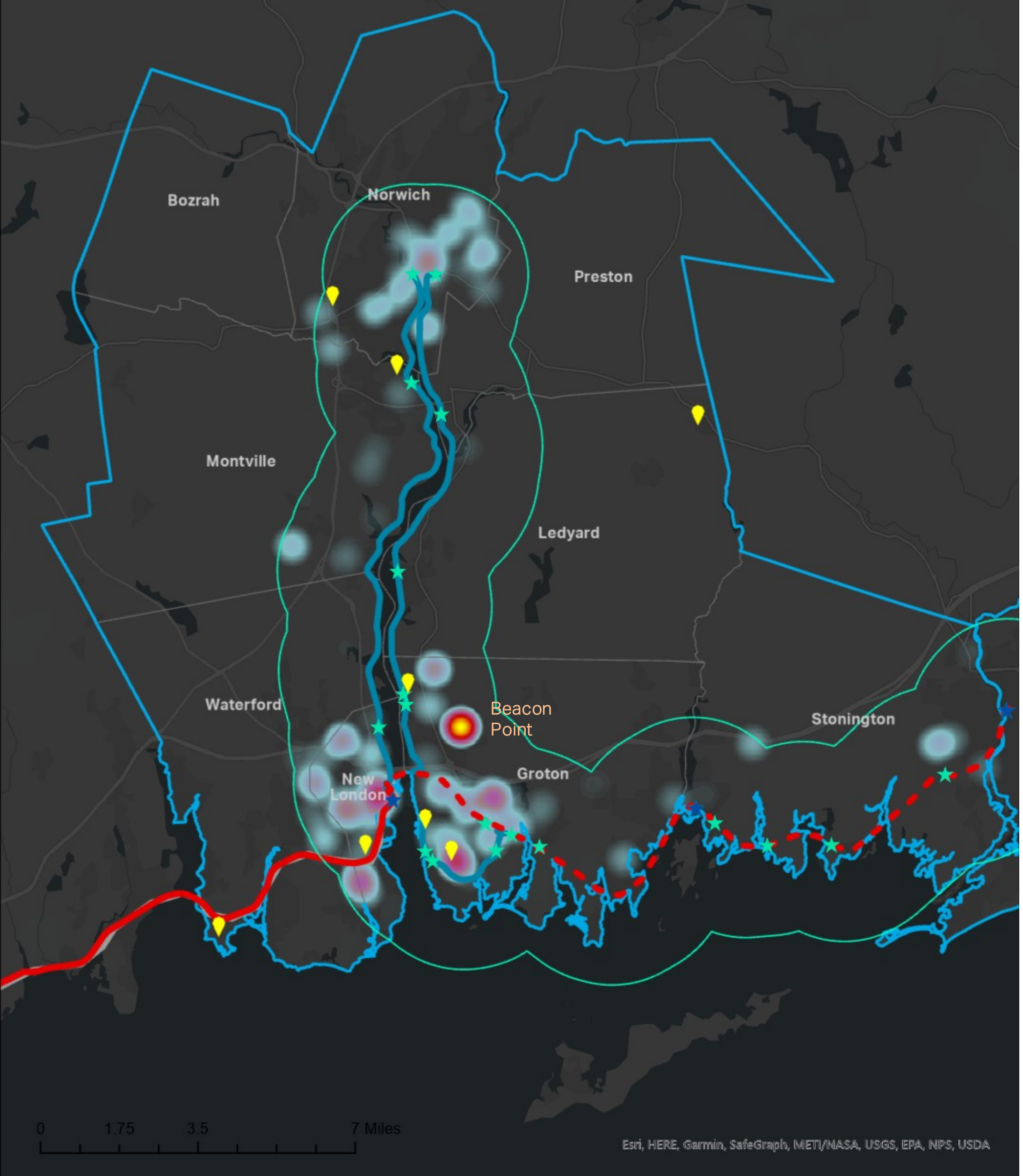
Major Employer

Sparse

Dense

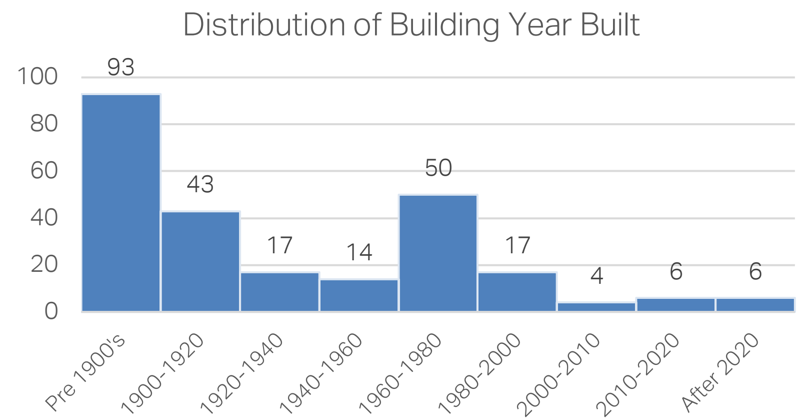
*Office Density weighted by rentable building area (rba)

Multifamily Residential Concentrations in TOD Focus Area



Key Takeaways:

- Most of the housing stock in the Focus Area and Study Area Communities is old, with minimal investment in multifamily housing in the last 40 years
- Beacon Point near the U.S. Naval Submarine Base in Groton has the largest concentration of units and serves active-duty military personnel, qualified retirees, Department of Defense (DOD) employees, as well as civilians



Source: CoStar, AECOM Analysis

Legend

- Existing Station
- Possible Station
- Major Employer

Sparse

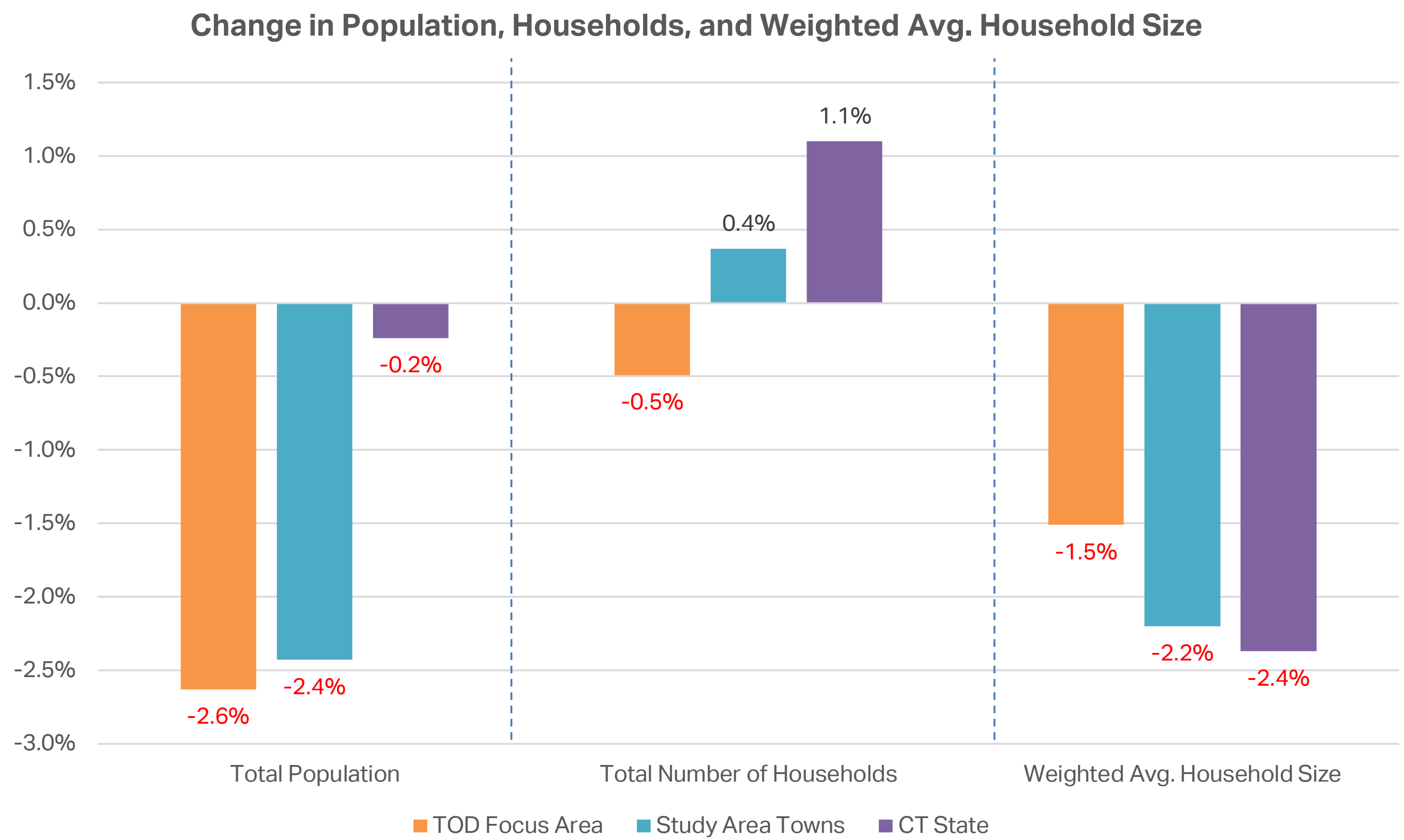
Dense

*Office Density weighted by rentable building area (rba)

3. DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS

Population and Household Change 2013-2019

- The population within TOD Focus Area and within the Study Area Communities is declining, much more quickly than in the state overall.
- Declining household sizes indicate that households are becoming smaller as the population ages – and the area is attracting few new, younger households.
- The share of householders 65 years old or older within the Study Area Communities increased from 23% to 27%, with shares of all other age groups declining.

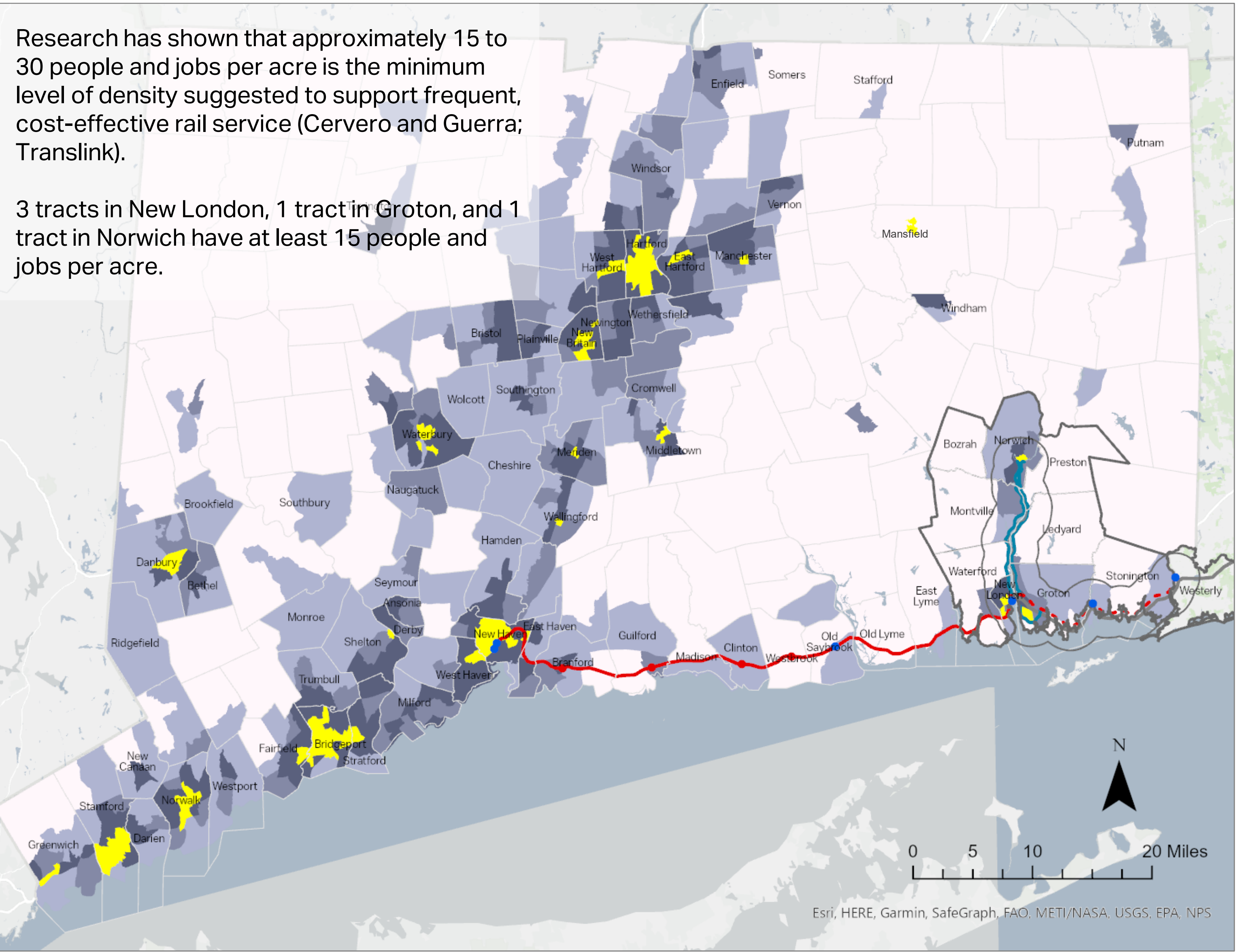


Source: 2013 and 2019 ACS 5-Year Estimates

Combined Population and Jobs Density

Research has shown that approximately 15 to 30 people and jobs per acre is the minimum level of density suggested to support frequent, cost-effective rail service (Cervero and Guerra; Translink).

3 tracts in New London, 1 tract in Groton, and 1 tract in Norwich have at least 15 people and jobs per acre.



Legend

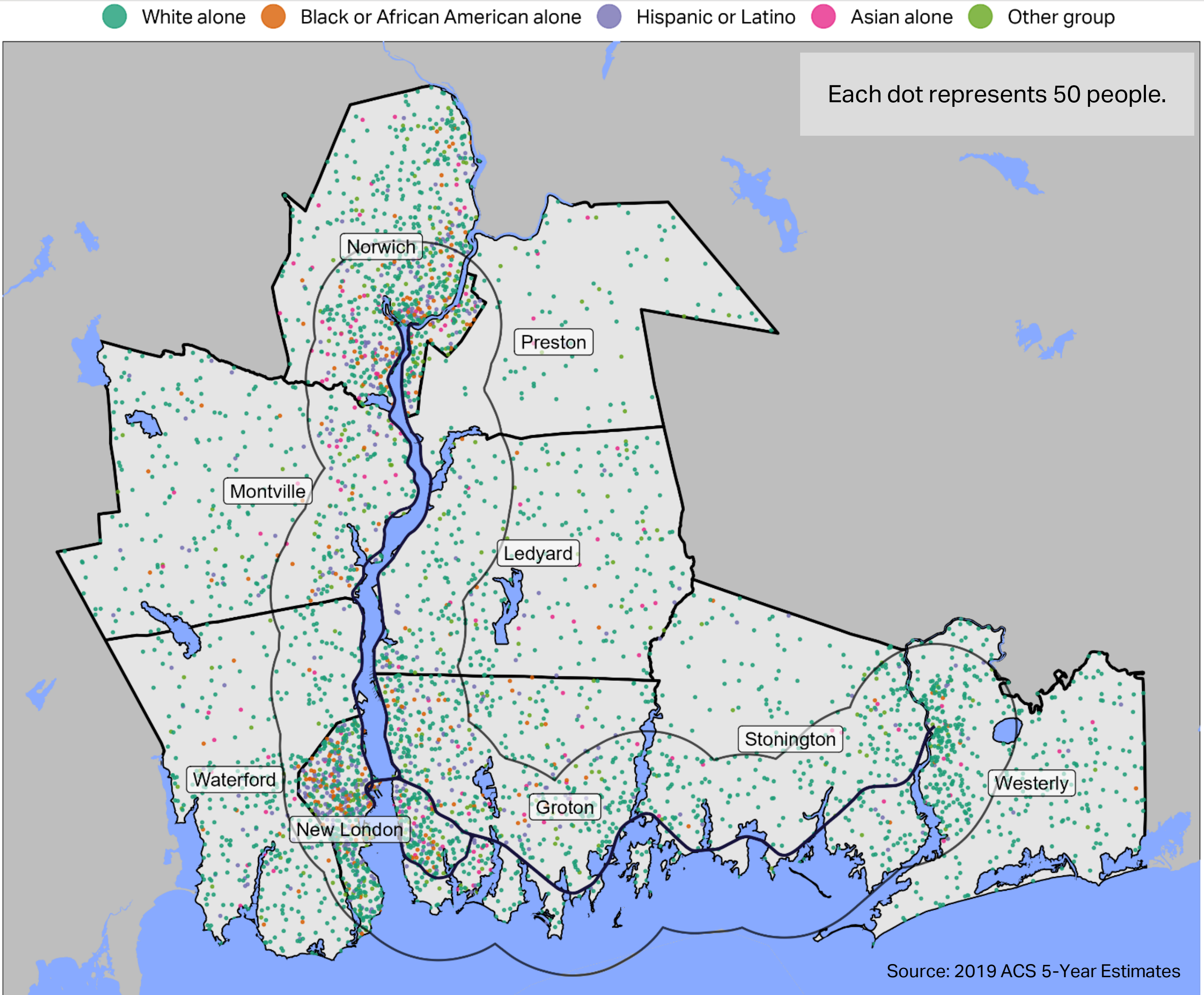
Combined Population + Jobs Per Acre*

- 0-1
- 2-3
- 4-5
- 6-15
- ≥ 15

- SLE Station
- Amtrak Station
- Existing SLE
- Existing Passenger Rail
- SLE Extension
- Norwich Corridor Rail Lines

Source: 2019 ACS 5-Year Estimates; 2019 LEHD Data; Robert Cervero and Erick Guerra, *Urban Densities and Transit: A Multi-Dimensional Perspective*, 2011; Translink, *Transit-Oriented Communities: A Literature Review on the Relationship between Built Environment and Transit Ridership*, 2010.

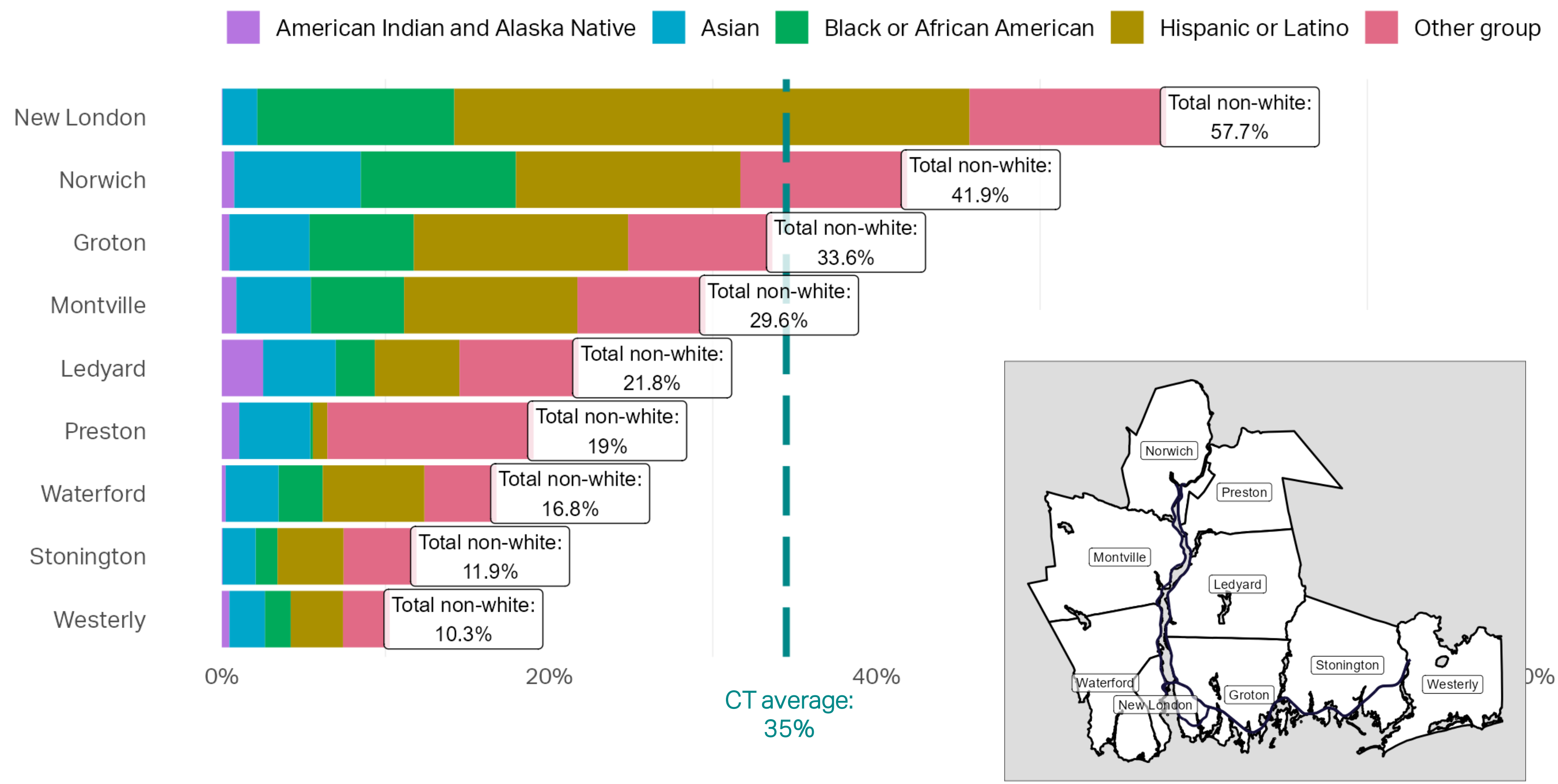
Population Density by Race/Ethnicity



- Non-white populations are concentrated in New London and Norwich
- Low population densities outside of city centers in Norwich, New London, Groton, and, Westerly

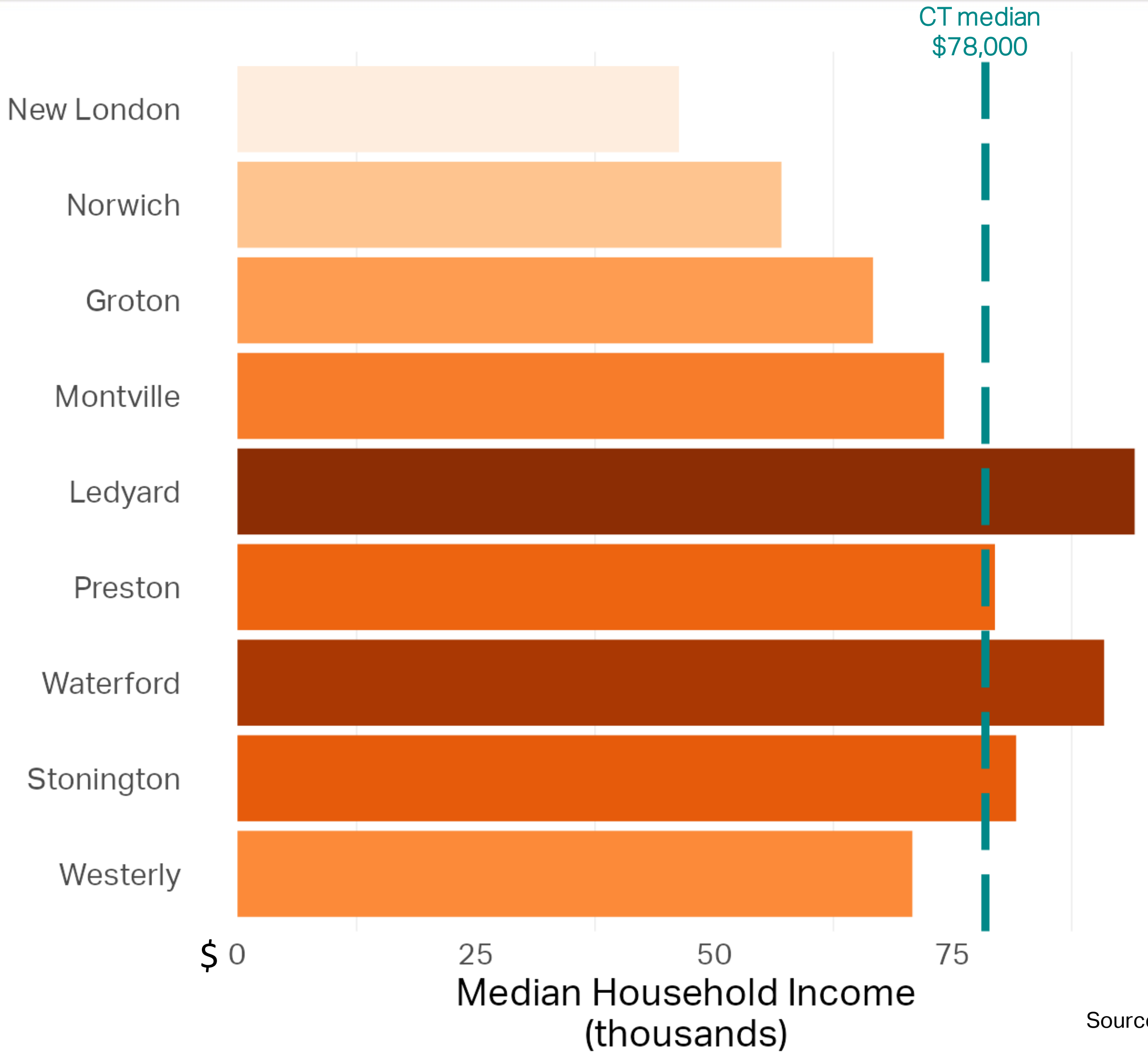
Race/Ethnicity by Community

Non-White Population by Race/Ethnicity



Source: 2019 ACS 5-Year Estimates

Median Household Income



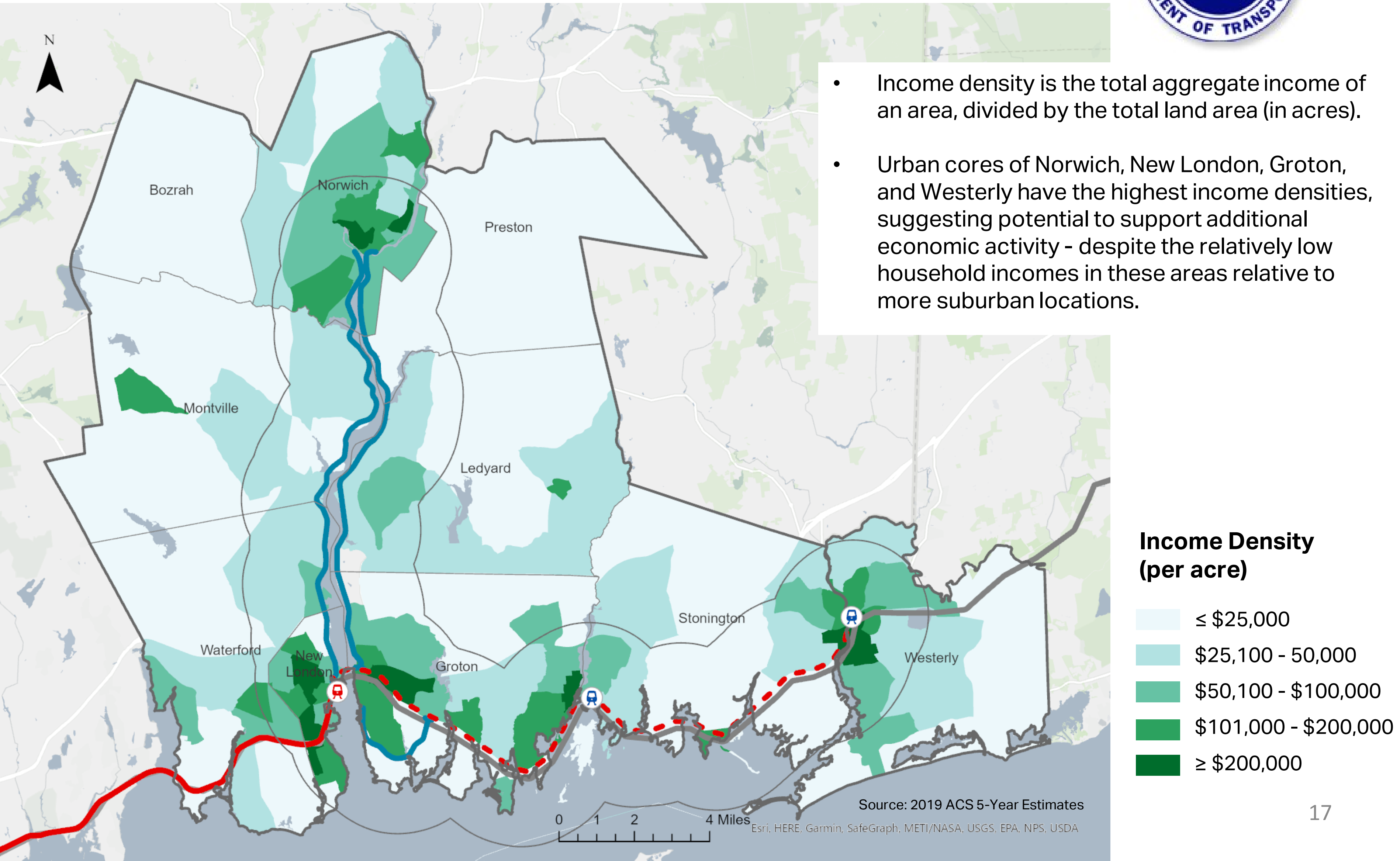
- New London and Norwich, the two densest and most ethnically diverse communities, also have the lowest median household incomes within the Study Area Communities

- Ledyard and Waterford, two primarily suburban communities, have the highest median household incomes

Source: 2019 ACS 5-Year Estimates

Income Density

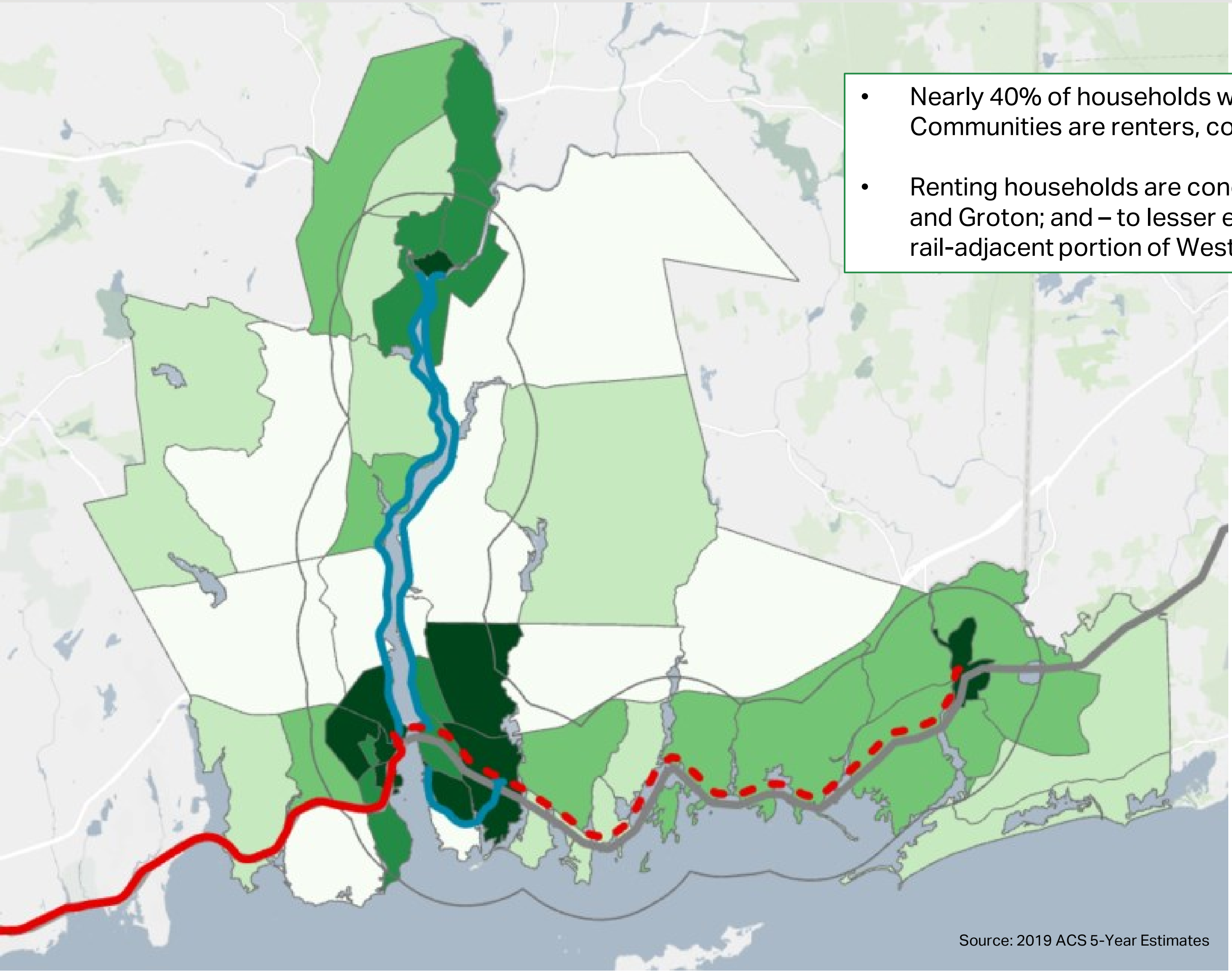
- Income density is the total aggregate income of an area, divided by the total land area (in acres).
- Urban cores of Norwich, New London, Groton, and Westerly have the highest income densities, suggesting potential to support additional economic activity - despite the relatively low household incomes in these areas relative to more suburban locations.



4. HOUSING STOCK & AFFORDABILITY

Housing Tenure

- Nearly 40% of households within the Study Area Communities are renters, compared to 34% statewide.
- Renting households are concentrated in New London and Groton; and – to lesser extents – in Norwich and the rail-adjacent portion of Westerly.

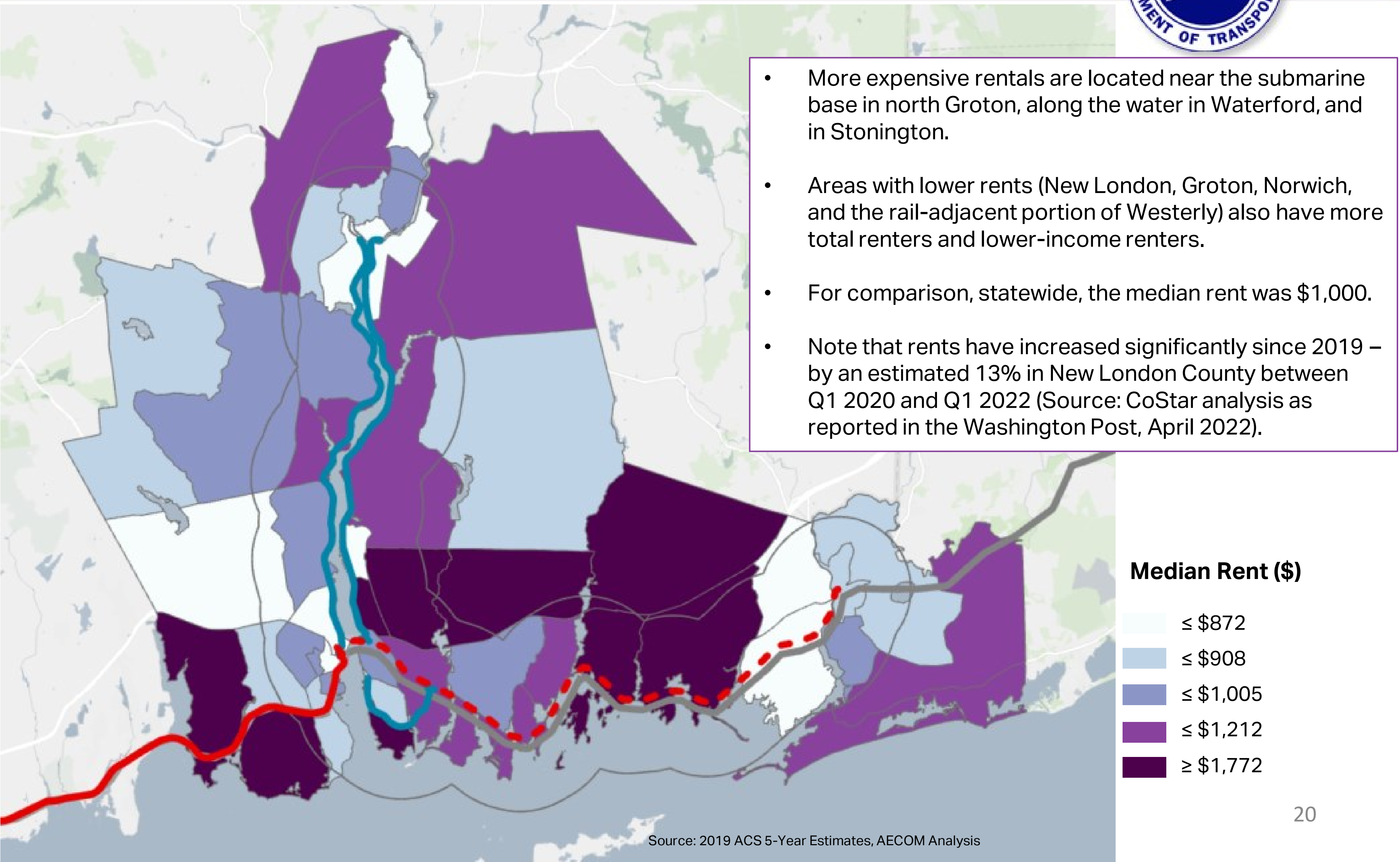


Source: 2019 ACS 5-Year Estimates

Rental Rates

- ≤ 16%
- ≤ 25%
- ≤ 42%
- ≤ 61%
- ≥ 85%

Median Rent, 2019

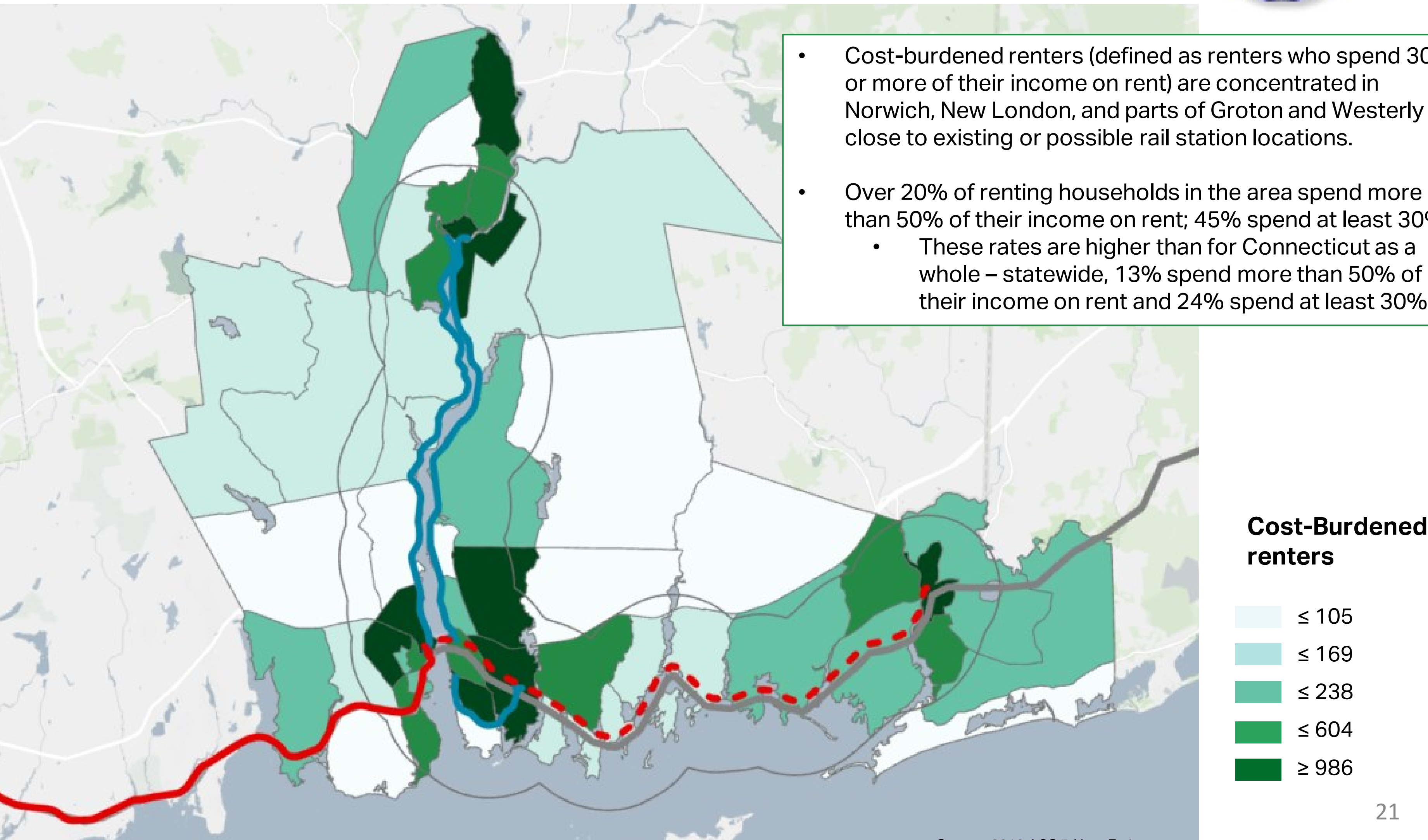


- More expensive rentals are located near the submarine base in north Groton, along the water in Waterford, and in Stonington.
- Areas with lower rents (New London, Groton, Norwich, and the rail-adjacent portion of Westerly) also have more total renters and lower-income renters.
- For comparison, statewide, the median rent was $1,000.
- Note that rents have increased significantly since 2019 – by an estimated 13% in New London County between Q1 2020 and Q1 2022 (Source: CoStar analysis as reported in the Washington Post, April 2022).

Source: 2019 ACS 5-Year Estimates, AECOM Analysis

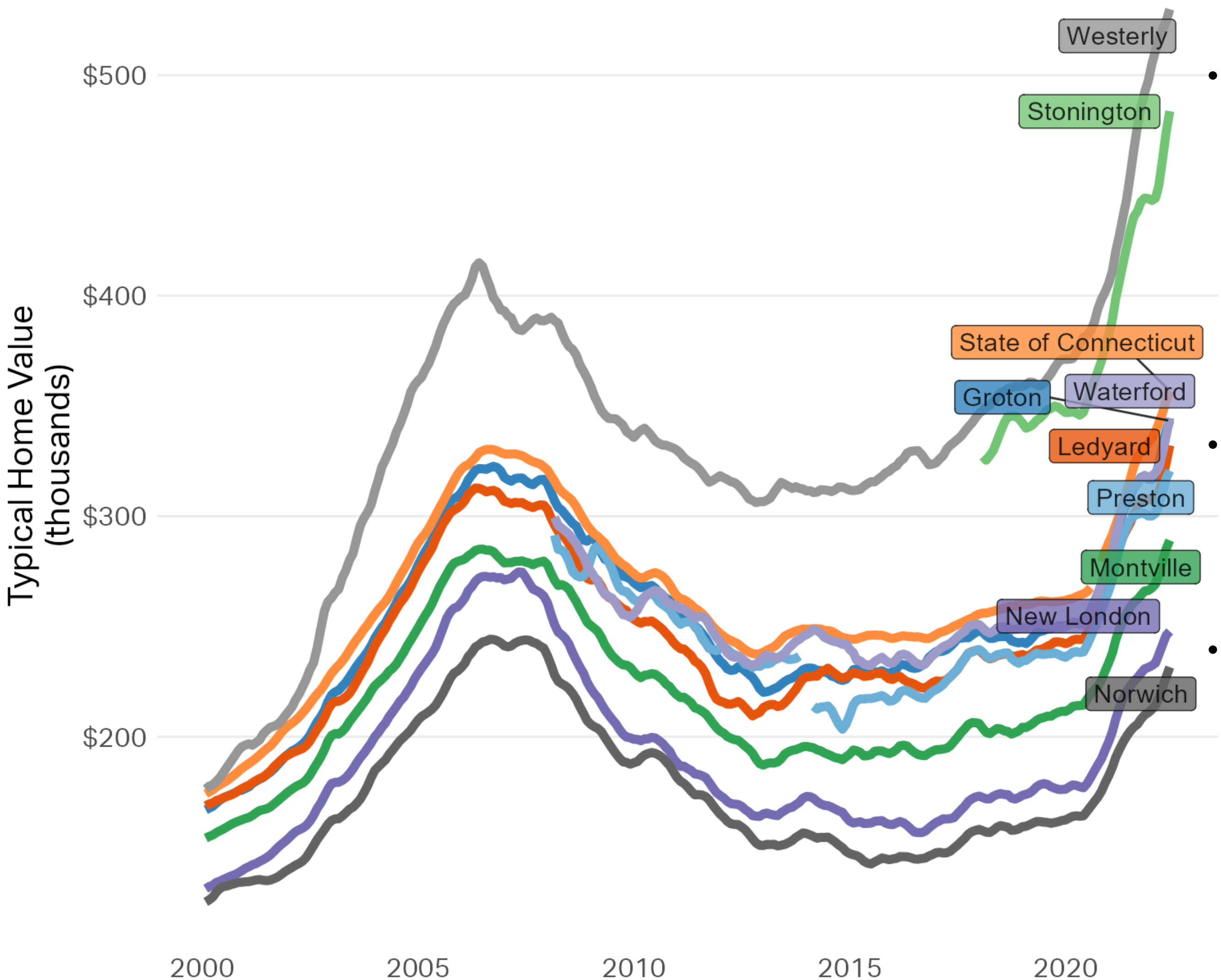
Cost-Burdened Renters

- Cost-burdened renters (defined as renters who spend 30% or more of their income on rent) are concentrated in Norwich, New London, and parts of Groton and Westerly close to existing or possible rail station locations.
- Over 20% of renting households in the area spend more than 50% of their income on rent; 45% spend at least 30%.
  - These rates are higher than for Connecticut as a whole – statewide, 13% spend more than 50% of their income on rent and 24% spend at least 30%.



Source: 2019 ACS 5-Year Estimates

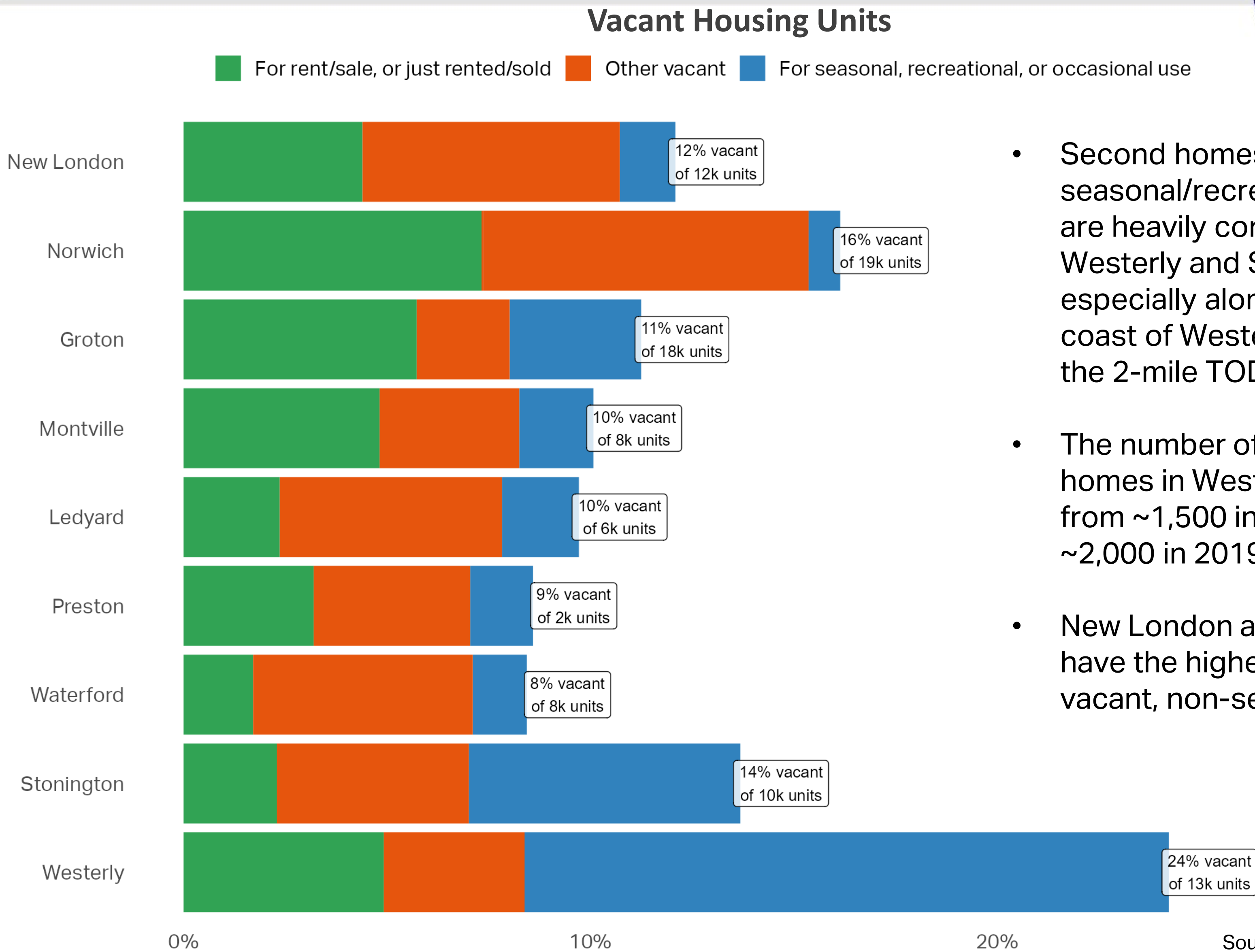
Home Values over Time



- The Study Area Communities include both high priced, affluent suburbs like Ledyard, Groton, Waterford, Westerly and Stonington; and lower-income, lower-cost communities like Norwich and New London
- The vacation rental market may contribute to high prices along the coast in Westerly and Stonington
- The difference in sales prices between the most and least expensive markets within the Study Area Communities are significant and have broadened over time.

Source: Zillow Home Value Index (ZHVI)

Seasonal/Recreational Housing



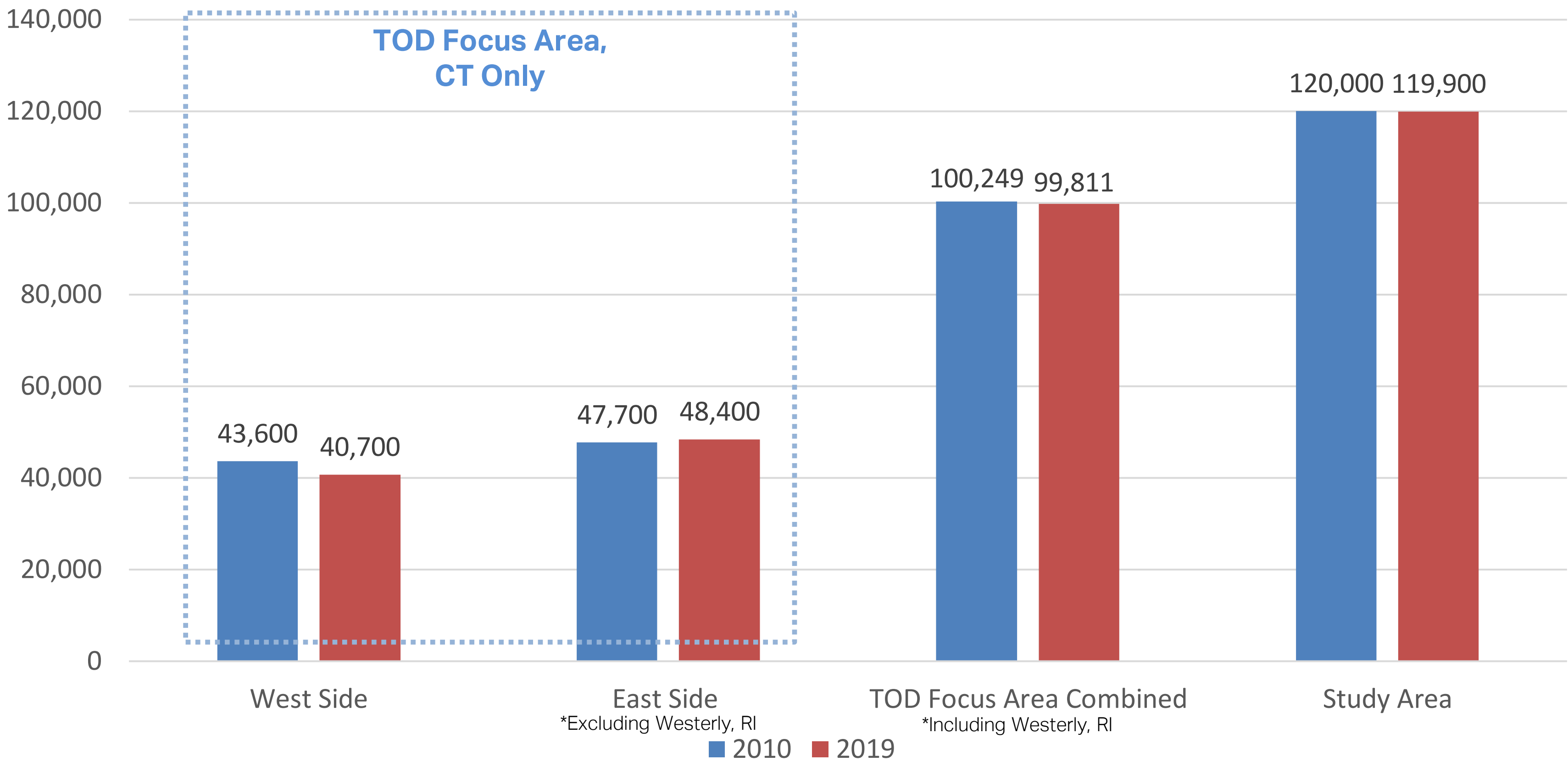
- Second homes for seasonal/recreational use are heavily concentrated in Westerly and Stonington, especially along the south coast of Westerly (outside the 2-mile TOD focus area).
- The number of vacation homes in Westerly increased from ~1,500 in 2010 to ~2,000 in 2019.
- New London and Norwich have the highest rates of vacant, non-seasonal homes.

Source: 2019 ACS 5-Year Estimates

5. EMPLOYMENT CHARACTERISTICS

Total Jobs (2010-2019)

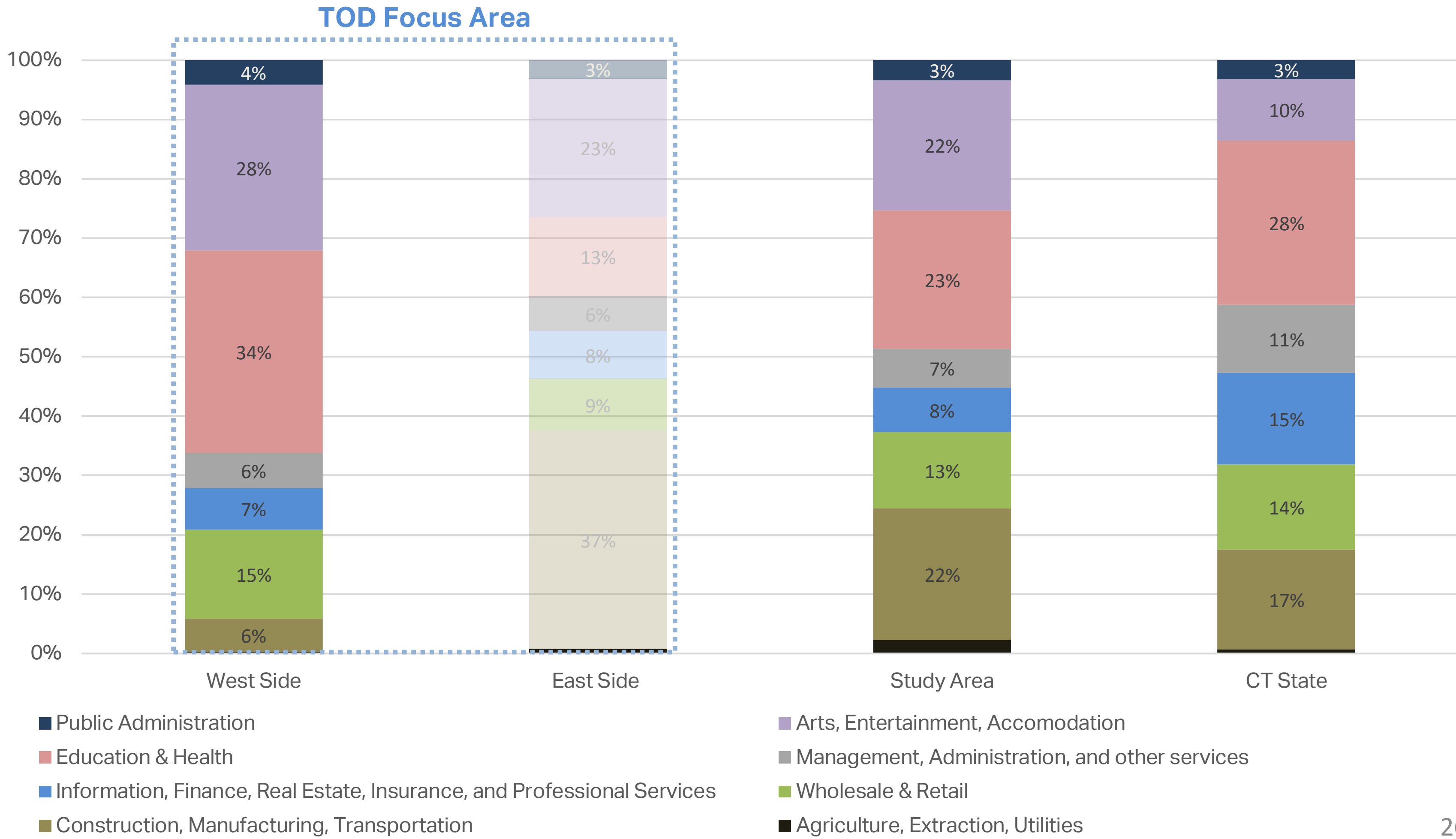
- The West Side of the Thames River TOD Focus Area experienced a 6.6% loss in jobs between 2010 and 2019. Most losses were in the Wholesale & Retail and Entertainment & Accommodation sectors.
- The East Side of the Thames River TOD Focus Area, where the top three employers (U.S. Navy Base, Electric Boat, and Pfizer) are located, saw a small increase.
- Overall, the TOD Focus Area accounts for 84% of the jobs in the Study Area Communities.



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (2010-2019)

Industries on the West Side of the Thames River (2019)

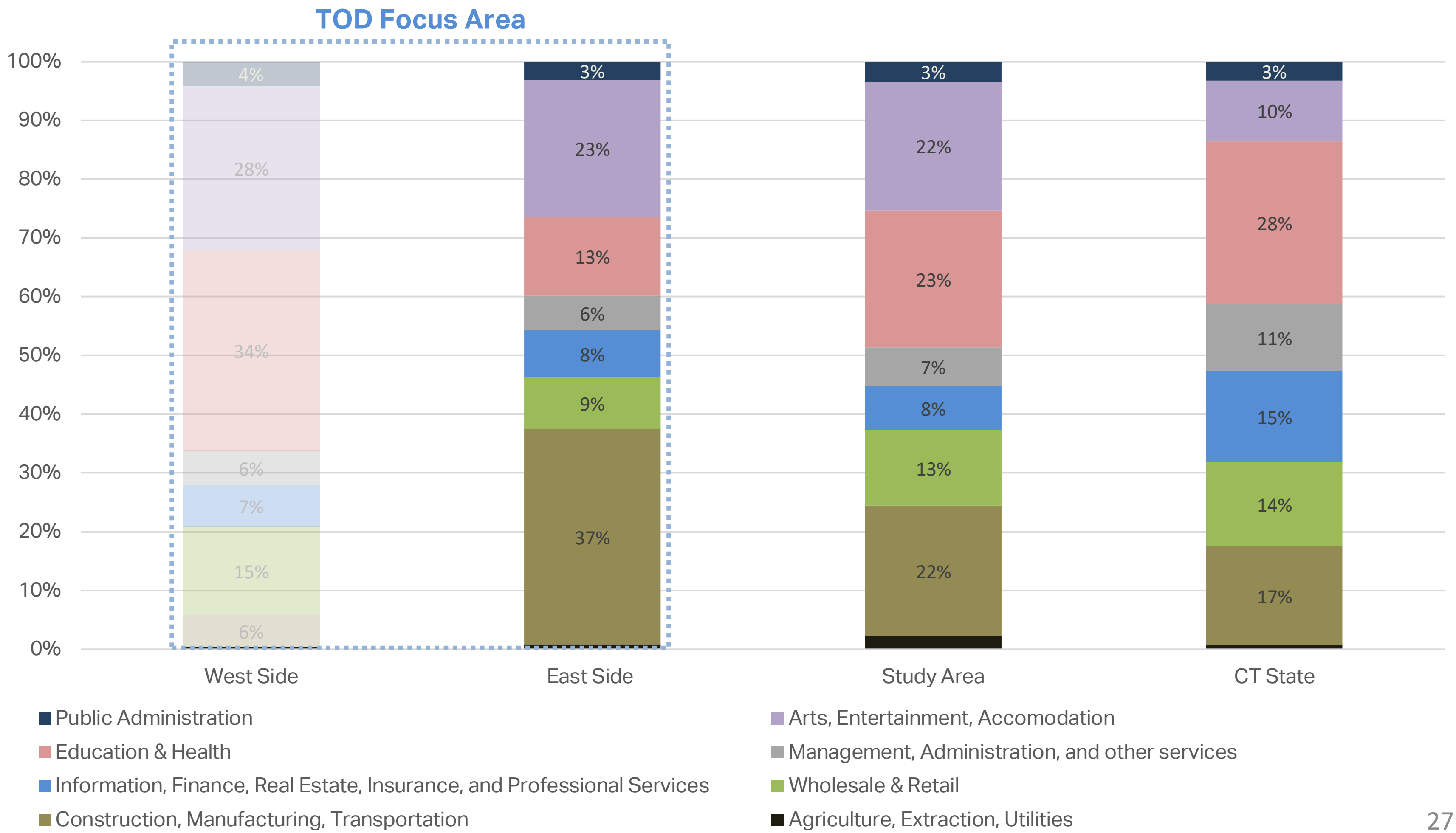
- Employment on the West Side of the Thames River is concentrated in Education and Health, and Arts, Entertainment, and Accommodation sectors.
- The industry mix is influenced in part by the presence of Connecticut College, the US Coast Guard Academy, and major hospitals on the West, as well as Mohegan Sun Resort and Casino.



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (2010-2019)

Industries on the East Side of the Thames River (2019)

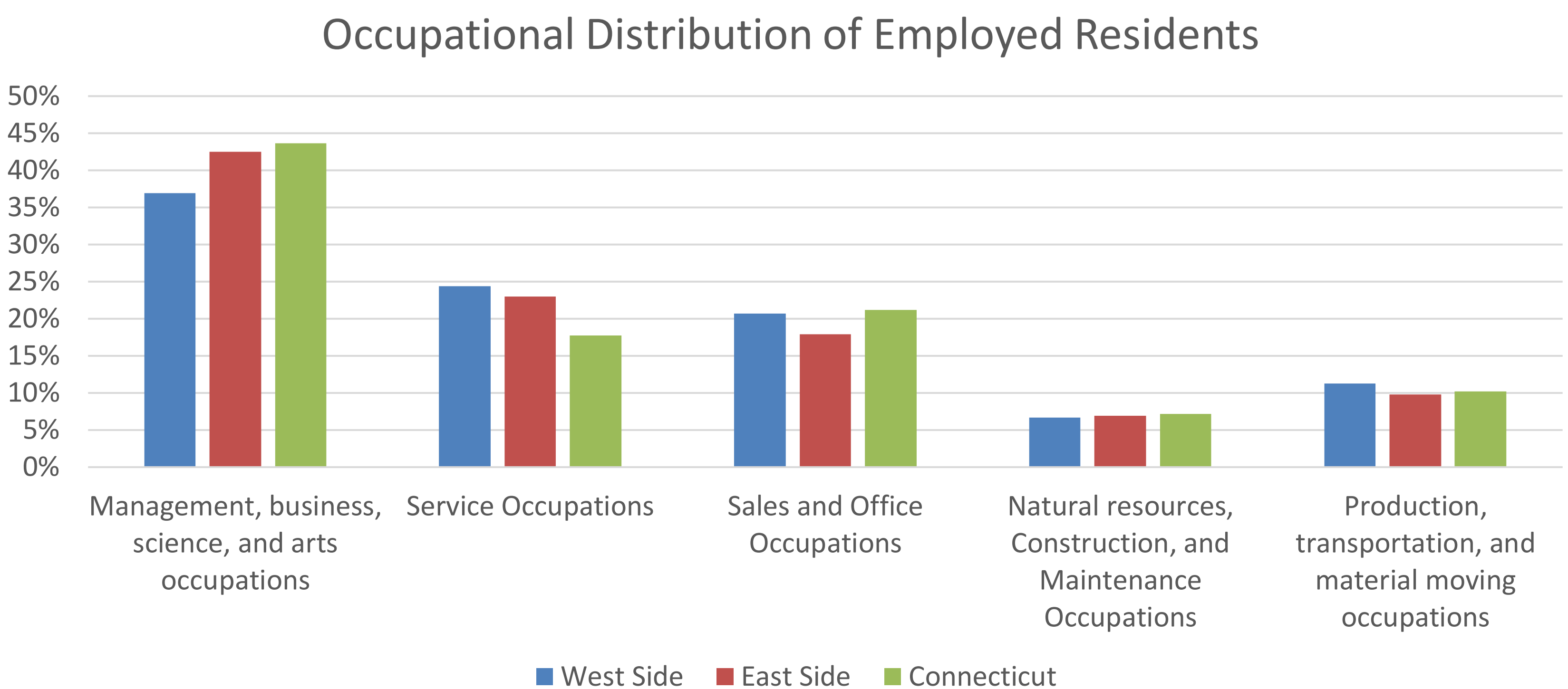
- The largest sectors on the East Side of the Thames River are Construction, Manufacturing, Transportation and Arts Entertainment, and Accommodation.
- Employment on the East side is in Groton, with major employers such as General Dynamics Electric Boat and Pfizer. Service and hospitality work is centered in the Foxwood Casino & Resort in Ledyard.



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (2010-2019)

Occupations within the Study Area Communities

- Occupations on the West Side of the Thames River are more concentrated in service and sales.
- The East Side of the Thames River has higher percentages of occupations in management, business, science, and arts—jobs that are more suited for remote work and that have experienced high rates of work from home during the pandemic.



Source: U.S. Census Bureau, 2019 ACS 5-Year Estimates, Industry by Occupation for Civilian Employed Population 16 Years and Over

Pandemic Era Changes (2019-2022)

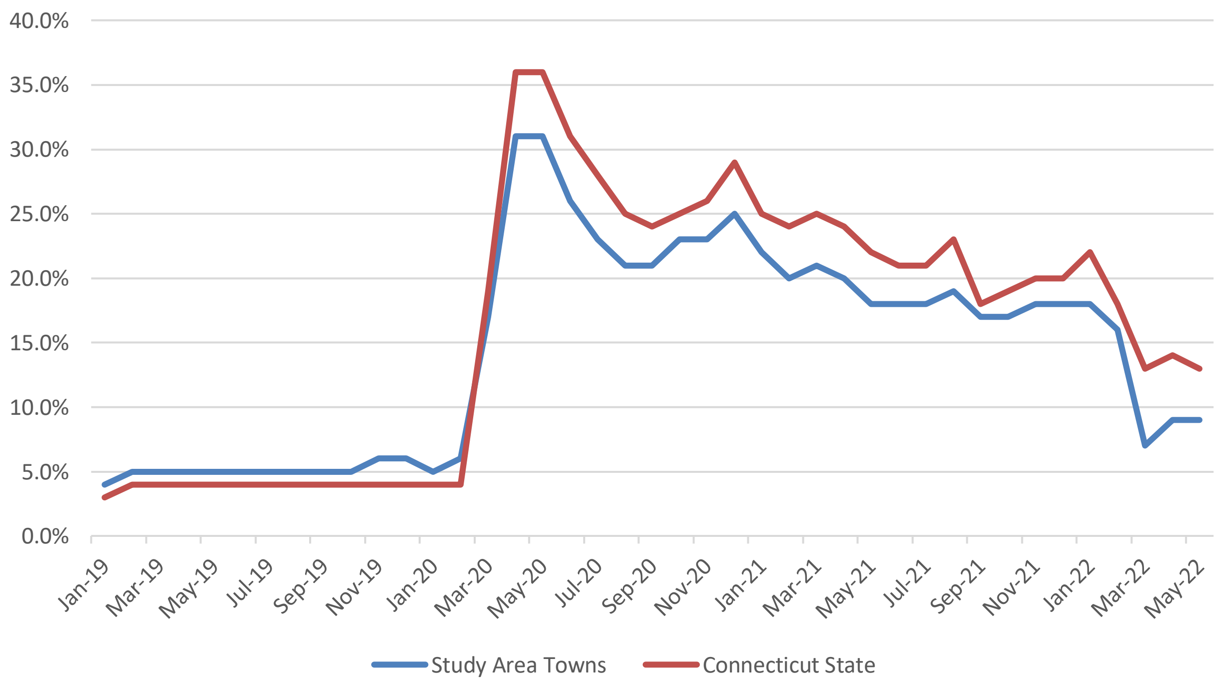
- Work from home rates have remained lower in both the Study Area Communities and Focus Area than statewide throughout the pandemic — presumably because the occupations in Study Area Communities are concentrated in fields that typically require on-site work like engineering, service, and healthcare.
- Overall, the number of employed residents in the TOD Focus Areas has declined since 2019 – which could reflect some combination of population and/or job loss during the pandemic.
- Remote-accessible occupations were more resilient and experienced less decline compared to other occupations.

% Change in Occupations within TOD Focus Area 2019-2022

	Total
High Remote-Accessible Occupations	-7%
All Other Occupations	-11.3%
All Occupations	-10.5%

*High remote-accessible occupations defined as occupations in Standard Occupational Classification (SOC) codes: 11, 13, 15, 27-3000, 43-6000, 43-9000. These include occupations in advertising, marketing, managers, business operation specialists, finance, computers, mathematical sciences, media and communication, and other office and administrative support staff.

Work From Home Rates in Study Area Communities, 2019-2022



Source: EMSI, 2019-2022 Occupations data, REPLICA Residents working from home data, 2019-2022

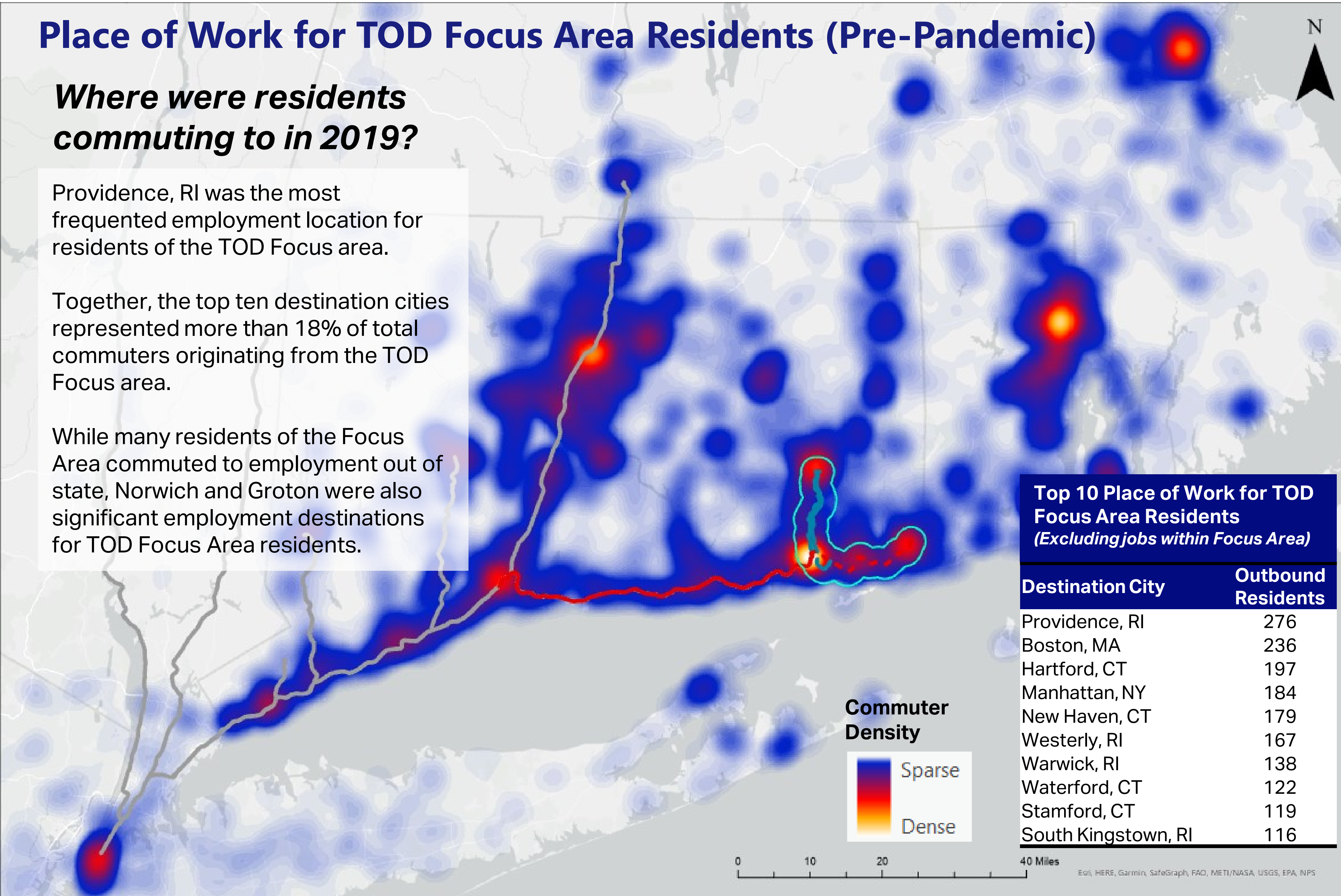
Place of Work for TOD Focus Area Residents (Pre-Pandemic)

Where were residents commuting to in 2019?

Providence, RI was the most frequented employment location for residents of the TOD Focus area.

Together, the top ten destination cities represented more than 18% of total commuters originating from the TOD Focus area.

While many residents of the Focus Area commuted to employment out of state, Norwich and Groton were also significant employment destinations for TOD Focus Area residents.



Top 10 Place of Work for TOD Focus Area Residents
(Excluding jobs within Focus Area)

Destination City	Outbound Residents
Providence, RI	276
Boston, MA	236
Hartford, CT	197
Manhattan, NY	184
New Haven, CT	179
Westerly, RI	167
Warwick, RI	138
Waterford, CT	122
Stamford, CT	119
South Kingstown, RI	116

Source: US Census, OnTheMap, LEHD LODES Data, 2019

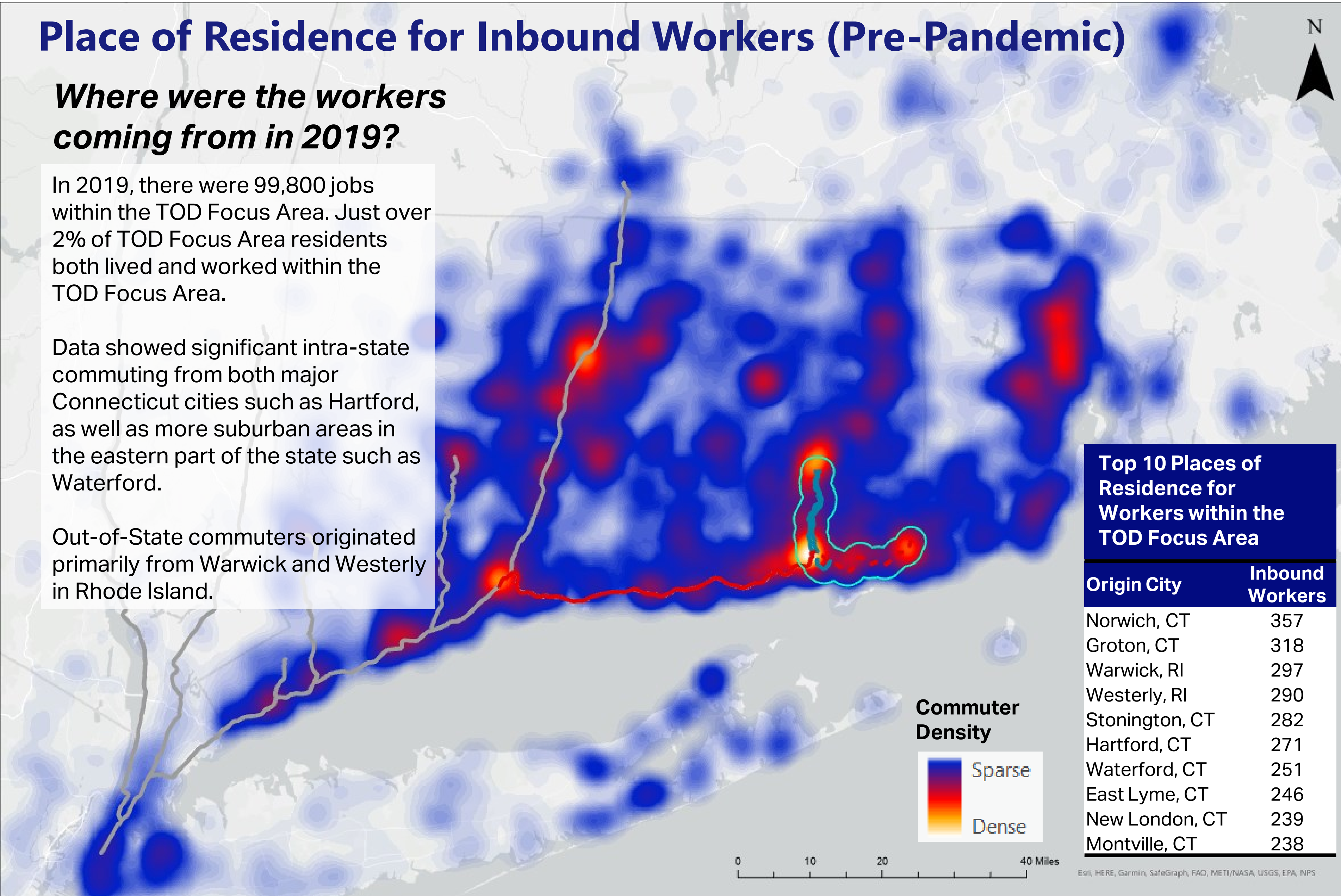
Place of Residence for Inbound Workers (Pre-Pandemic)

Where were the workers coming from in 2019?

In 2019, there were 99,800 jobs within the TOD Focus Area. Just over 2% of TOD Focus Area residents both lived and worked within the TOD Focus Area.

Data showed significant intra-state commuting from both major Connecticut cities such as Hartford, as well as more suburban areas in the eastern part of the state such as Waterford.

Out-of-State commuters originated primarily from Warwick and Westerly in Rhode Island.



Top 10 Places of Residence for Workers within the TOD Focus Area

Origin City	Inbound Workers
Norwich, CT	357
Groton, CT	318
Warwick, RI	297
Westerly, RI	290
Stonington, CT	282
Hartford, CT	271
Waterford, CT	251
East Lyme, CT	246
New London, CT	239
Montville, CT	238

Source: US Census, OnTheMap, LEHD LODES Data, 2019

6. KEY TAKEAWAYS: IMPLICATIONS FOR TRANSIT AND TOD

Implications for Transit Planning

- **More densely populated urban cores** (e.g., in New London, Norwich, Groton) are likely to support the most transit ridership; densities in those three cities each have population + job densities of at least 15/acre, reaching the level suggested to sustain TOD.

- **Discussions with major employers and major activity centers** augment the data on potential for ridership from workers and visitors, as well as opportunities to shift new investment proximate to stations or invest in last-mile connections
  - E.g. General Dynamics Electric Boat reported plans to add 18,000 more employees over the next decade.

- Given relatively low population and job densities along the corridors, **supportive land use policies and local infrastructure investments** will be critical to both connect existing populations to the stations and encourage higher density development.

NBC Connecticut. Electric Boat Needs to Hire Thousands in 2022. https://www.nbcconnecticut.com/news/local/electric-boat-needs-to-hire-thousands-in-2022/2698451/, January 2022.

Implications for TOD

- Underlying historic market conditions appear challenging for TOD:
  - Declining and aging population; low population densities
  - Slow or negative employment growth (though some signs of growth – e.g., General Dynamics Electric Boat)
  - Lack of modern housing & limited recent investment in multi-family housing, office, and retail
  - Limited mobility options – including limited transportation connectivity within the Study Area Communities, and to the broader region

Transit as an Economic Development Catalyst

- However, a new transit investment could help serve as a **catalyst for economic development.** The economic impacts of new transit are likely to depend on factors including the extent to which service:
  - **Improves travel times relative to existing commute modes** to regional employment destinations such as Providence, Boston, Hartford, Manhattan, and New Haven
  - **Provides direct connections to major employers** such as the U.S. Navy Submarine Base, General Dynamics Electric Boat and Pfizer on the East Side of the Thames River; Lawrence Memorial Hospital, Connecticut College, and Mohegan Sun Resort and Casino on the West Side of the Thames River
  - **Provides transit access to other major activity centers** like Mystic Seaport, Mystic Aquarium, Foxwoods; New London, Groton, Norwich, Mystic and Stonington downtowns
  - **Directly benefits more densely populated urban cores** (e.g., in New London, Norwich, Groton) where population densities are higher and local land use patterns and demographics may be more supportive of transit ridership